

Racer populations from the Levant to the Caspian region referred to *Platyceps ventromaculatus* (Gray, 1834) (Reptilia: Squamata: Colubrinae)

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Racer populations from the Levant to the Caspian region referred to *Platyceps ventromaculatus* (Gray, 1834) (Reptilia: Squamata: Colubrinae). - Populations of Gray's racer from southeastern Anatolia and Syria to western Iran (*Platyceps* cf. *ventromaculatus*) show considerable variability in a number of scale characters, dorsal colour pattern, dentition, and hemipenis length. *Zamenis rogersi* Anderson is conspecific with *P.* cf. *ventromaculatus* (Gray). This taxon is recorded from the Cyrenaica (eastern Libya) to at least as far east as the Kopet Dag area (Golestan). Its distribution in eastern Iran and the systematic status of northern African and Middle East populations vis-à-vis Sindian *P. ventromaculatus* (*sensu stricto*) are in need of further investigations.

Keywords: *Platyceps* cf. *ventromaculatus* - *Zamenis rogersi* Anderson - morphology - distribution - systematics.

INTRODUCTION

Since the days of Günther (1858) and Boulenger (1893), *Platyceps ventromaculatus* (Gray, 1834) has been considered to be distributed from "Mesopotamia" to the Indian subcontinent. Roughly a century later, Baran (1982) and Disi (1993) recorded Gray's racer from Turkey and Jordan, respectively. However, Khan (1997: 58) averred that *P. ventromaculatus* "does not extend westward beyond the Indus."

Disi *et al.* (1999) emphasized that *Platyceps ventromaculatus* "is hardly to be distinguished" from North African and Near East racers commonly referred to *P. rogersi* (Anderson, 1893) and that the "systematic status of these two nominal taxa deserves investigation." Schätti (2005) analyzed a larger sample of Rogers' racers and concluded that this taxon may be conspecific with Middle East racers assigned to *P.* cf. *ventromaculatus*.

The present study investigates the morphology of populations from Syria to the eastern Arabian Peninsula and Golestan, Iran, usually referred to Gray's racer and discusses their systematic status and phylogenetic relationships.

MATERIAL AND METHODS

Morphological characters were ascertained in 177 specimens from Syria to Iran and the United Arab Emirates, i.e., Sir Bani Yas Island (Appendix) loaned by the

following institutions: The Natural History Museum (British Museum [Natural History]), London (BMNH); California Academy of Sciences, San Francisco (CAS); Field Museum of Natural History, Chicago (FMNH); Museum of Comparative Zoology, Harvard University, Cambridge (MCZ); Muséum d'histoire naturelle, Genève (MHNG); Muséum National d'Histoire Naturelle, Paris (MNHN); Naturhistorisches Museum, Basel (NHMB); Naturhistorisches Museum, Wien (NMW); Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main (SMF); Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn (ZFMK); Zoologisches Museum, Universität Zürich (ZMZ).

Further acronyms used in the text are: AMNH (American Museum of Natural History, New York), ANSP (Academy of Natural Sciences, Philadelphia), CM (Carnegie Museum, Pittsburgh), HUJ (Zoological Museum, Hebrew University, Jerusalem), JUM (Jordan University Museum, Dept. of Biological Sciences, Amman), MSNM (Museo Civico di Storia Naturale, Milano), MVZ (Museum of Vertebrate Zoology, Berkeley), SZE (Institute of Systematic Zoology, Ege University, Bornova-Izmir), USNM (United States National Museum [Smithsonian Institution], Washington), and ZMB (Institut für Systematische Zoologie [formerly Zoologisches Museum], Museum für Naturkunde, Humboldt-Universität, Berlin).

Morphological terms and measurements are explained in Schätti (1988) and Schätti & McCarthy (2004). Numbers in parenthesis indicate intraspecific variation. The scale formulae give the dorsal scale row (dsr) counts at the 15th ventral, midbody, and five ventrals prior to the vent. The reduction pattern is expressed in terms of ventrals and as a percentage of their total number (%ven), based on the average of the right and left side. Maxillary teeth were usually examined on the right bone. The length of the hemipenis *in situ* and the insertion of the *M. retractor penis magnus* are given in absolute numbers of subcaudals and as a percentage thereof (%sub).

Comparative data for *Platyceps ventromaculatus* (*sensu stricto*) from India and Pakistan are from an unpublished manuscript (in prep.). Scientific names of the taxa discussed in this paper are usually given in full only at their first appearance. The synonyms include material not seen by the author and quoted in brackets. Coordinates are from the GEONET database (<http://earth-info.nima.mil>) and cited at their appropriate place (Appendix, synonymy, or Discussion).

RESULTS

Platyceps cf. *ventromaculatus* (Gray, 1834)

Coluber Chesneii [sic] Martin, 1838: 81 - "Euphrates" (file entry, precise origin unknown: BMNH 1946.1.12.95, see Discussion).

Coluber Chesneii [sic]. - Chesney, 1850: 734 (type series).

Zamenis Dahlii (Schinz, 1835) [sic] [partim]. - Duméril *et al.*, 1854: 693 ("en Perse": MNHN 7470, see Taxonomic Remarks).

Zamenis ventrimaculatus (Gray, 1834) [sic] var. A. - Günther, 1858: 106 ("Euphrates Expedition", syntype of *C. chesneii*).

Z.[amenis] persicus Jan, 1863: 65 - "Schiraz" [MSNM], "Persia" (MNHN 7470, see Taxonomic Remarks).

Zamenis ventrimaculatus [sic]. - Günther, 1864: [252] 254 (synopsis).

Zamenis persicus. - Jan & Sordelli, 1867: Pl. 2.1 ("Schiraz" [MSNM syntype]); Günther, 1868: 140 (see Taxonomic Remarks); Anderson, 1872: 393 (Shiraz [Province?]).

- Z.[amenis] Dahlii* [sic] (“Fitz.”) [partim]. - Blanford, 1876: 417 (“Aucher-Eloy's collection”, from Duméril *et al.*, 1854).
- Z.[amenis] ventrimaculatus* [sic] [partim]. - Blanford, 1876: 415 (“Bushire” [Bushehr]: BMNH 69.8.28.130); Theobald, 1876: 169 (“Mesopotamia”); Blanford, 1881: 680 (“Bushire”: BMNH 79.8.15.27, see footnote 1); Boulenger, 1890: [324] 325, and 1892: 632 (synopsis, keys); Boulenger, 1893: [381, 383] 399 (incl. “Mesopotamia” [BMNH 60.3.19.1295], “Fao, Persia” [Faw, Iraq]: incl. BMNH 92.9.1.5-7) ¹.
- ?*Acanthocalyx ventrimaculatus* [sic]. - Cope, 1896: 203, Pl. 21.5 [spread hemipenis] (“W. Asia”, see Taxonomic Remarks).
- Zamenis ventrimaculatus* [sic] [partim]. - Wall, 1914: 39 (Kuwait [Capt. Shakespeare]).
- Zamenis ventrimaculatus* [sic] (“Var. A. v. Günther”). - Werner, 1917: 211 (“Borazjûn” [Borazjan (Bushehr Province)], 29°16'N 51°12'E, not examined).
- ?*Zamenis ventrimaculatus* [sic] var. *semifasciatus* (Blyth, 1860) [partim]. - Werner, 1917: 209 (“Shirâz [...] oder [...] Buschâhr” [Bushehr, “Nr.” 147: ZFMK 31602, see Appendix]).
- Zamenis ventrimaculatus* [sic]. - Boulenger, 1920: 348 (Baghdad, Baqubah [33°45'N 44°38'E], Basra [30°30'N 47°49'E], “Esra's tomb” [approx. 31°25'N 47°18'E], “Faleya” [Fallujah, 33°21'N 43°47'E], “Samash” [Samarra], Shaibah [30°24'N 47°36'E], “Sheik Saada” [Shaykh Saad, 32°34'N 46°16'E], “Zobeya” [Az-Zubayr, 30°23'N 47°42'E]: BMNH 1919.7.18.14); Procter, 1921: 253 (Baghdad [Capt. Short], Al-Amarah [2, Capt. Evans]: BMNH 1921.3.29.2); Procter, 1926: 394 (“Hasan Island off Bahrain” [2, Maj. Daly; Saudi Arabia, 24°59'N 37°05'E]).
- Zamenis ventrimaculatus* [sic] [partim]. - Werner, 1929: [64] 71 (synopsis).
- Coluber ventromaculatus*. - Schmidt, 1930: 226, Fig. 1 [map] (“Kish”: FMNH 11064-65).
- Coluber ventrimaculatus* [sic]. - Corkill, 1932a: 16, 47 [Tb.], Pl. 9, and Corkill, 1932b: 559, Tb. [unnumbered] (Baghdad, Basra, Baqubah, Daur [34°27'N 43°48'E], Diwaniyah [33°00'N 44°35'E], [Baqubah] Hillah [32°29'N 44°26'E], An-Nasiriyah, Najaf [31°59'N 44°20'E], Tuz Khurmatu [Tuz Khurmatli, 34°53'N 44°37'E]).
- Coluber ventromaculatus*. - Schmidt, 1939: 74 (Al-Jubayl [MVZ 25624]; Baghdad [incl. FMNH 19494-95, 19507], An-Nasiriyah [incl. FMNH 22697, 22699 (exchanged to MVZ)]; Yezd-i-Khast: FMNH 19501, 19505-06, 20939, 22695-96, 22698, 22700-17, 26357-58, 28316-18); Clark & Inger, 1942: 167 (scale row reduction: FMNH 26357).
- Platyceps ventromaculatus*. - Inger & Clark, 1943: 144 (comb. n., scale row reduction: FMNH 19501).
- Zameni* [sic] *ventrimaculatus* [sic]. - Dickson, 1949: 471 (Kuwait [City]).
- Coluber (Platyceps) karelini* Brandt, 1838 [partim]. - Guibé, 1957: 139 (“Dash Bouroun [Dashli Borun], poste frontière sur l'Atrek, au N.-E. de Gombad-i-Qabus” [Gonbad-e-Qabus]: MNHN 1957.59).
- Coluber ventromaculatus* [partim]. - Haas, 1957: 79 (Dhahran: CAS 84544, 84554, 84565, FMNH 74000).
- Coluber ventromaculatus*. - Reed & Marx, 1959: 105 (“Kirkuk Liwa [Province], Chemchemical Centre Nahiya [District], Jarmo”: FMNH 74633-37, see Appendix); Khalaf, 1959: [54] 75 (“Iraq”); Khalaf, 1960: 16 (incl. Anah [34°28'N 41°56'E], Rawah [34°28'N 41°55'E]); Weber, 1960: 154 (Baghdad); Haas, 1961: 20, Tb. 1 (Abqaiq [25°56'N 49°40'E, CM 33508-09], “Al Hasa, 2 miles S. of Qatif” [Al-Qatif, 26°31'N 50°01'E, CM 33541-42]).
- Coluber ventromaculatus* auct. - Anderson, 1963: 477 (checklist).
- Coluber rhodorhachis* (Jan, 1863) [sic] [partim]. - Raï, 1965: 41, Pl. III.7-10, map 8 (illustrated specimen likely from “Bandar Chapour” [Bandar-e-Shahpur, 30°26'N 49°06'E] or Bushehr).
- Coluber ventromaculatus*. - Mandaville, 1967: 117 (“near Al Ajam [26°34'N 49°57'E], in the oasis area of Al Qatif”).
- Coluber ventromaculatus*. - Haas & Werner, 1969: 363, Fig. 1 [map] (“Kish area” and “without data” [“HF-79, probably Kish area, Hilla, Iraq”]: MCZ 58868, 123181).

¹ Boulenger (1893) erroneously listed BMNH 79.8.15.27 as a male with 199 ventrals and 82 subcaudals, the latter being the lowest value reported for the species as a whole. This female has 205 ventrals and 110 subcaudals.

- Coluber ventromaculatus*. - Gallagher, 1971: [6] 28, Fig. [unnumbered] (Al-Awali, "Budaia" [Budaiya]: BMNH 1971.1456-57).
- Coluber ventromaculatus* [partim]. - Gasperetti, 1974: 18, Fig. 11 [map] (literature records); Eissa & El-Assy, 1975: 128 (Kuwait)²; Gasperetti, 1977: 5 (short review).
- Coluber ventromaculatus*. - Baran, 1982: 54, Fig. 1 (Hamzababa Ceylanpınar [Urfa, 36°51'N 40°03'E, SZE 93/1977]).
- Coluber ventromaculatus* [partim]. - Schätti, 1987: [402] 412, Tb. 1 [pholidosis, osteology, hemipenis], Fig. 2 [vertebra ratios] ("*C. rhodorachis*" group).
- Coluber ventromaculatus*. - Gasperetti, 1988: 216 [404], Fig. 26 [CAS 84544], Figs 27-28 [maps], Pl. 2 ["Bahrain"] (Hamalah, "Jisra", "Zallaq" [Bahrain]; "Hufuf" [Saudi Arabia]: BMNH 1970.2485-86, 1971.120-125, 1971.1458, 1979.711); Al-Sadoon, 1989: 28, Fig. 2 [map], Pl. 1d ("Al-Riyadh [24°38'N 46°46'E] and Al-Diriyah"); Gruber, 1989: 94, photograph [unnumbered] (no origin given); Gallagher, 1990: 13, photograph ("Bahrain"); Brown, 1991: 28 (Sir Bani Yas Island); Tiedemann, 1991: 172, Figs 2-3 ("Insel Sir Bani Yas": NMW 32192).
- Coluber ventromaculatus* [partim]. - Leviton *et al.*, 1992: [89, Figs B-C] 93, Pl. 15F-G (Kuwait: Sabiya Peninsula [As-Sabiyah, approx. 29°36'N 48°07'E]); Disi, 1993: 111 ("Iraq" [ZMB 23780], "Iraq, Lieu"; "East Khosrovi, Quasv e Shinu": "GM 2443.12" [MHNG 1359.12], 2443.17).
- Coluber ventrimaculatus* [sic] [partim]. - Latifi, 2000: 270 (Iran, see Discussion).
- Platyceps ventromaculatus* [partim]. - Schätti & McCarthy, 2001: 81 [87] (revalidation of *Platyceps* Blyth); Schätti & Utiger, 2001: 935, Tbs 8-9 (molecular evidence [MHNG 2443.10 and 2629.97, Pakistan]).
- Coluber ventromaculatus*. - Soorae, 2004: 37 (Sir Bani Yas Island [introduced?]).
- Platyceps rogersi* [partim]. - Schätti, 2005: 163, Fig. 1, Tb. 1 (FMNH 19588, HUI 8303, MNHN 1935.370-72, 1986.538, NHMB 16444-46, ZISP 17017, see Discussion).
- Platyceps* cf. *ventromaculatus*. - Schätti, 2005: 170 [174], Fig. 1 (Ceylanpınar [SZE 93/1977]; Abu Kamal; An-Nasiriyah, Baghdad, "Euphrates" [syntype of *Coluber chesneii*], Kirkuk Province: BMNH 1946.1.12.95, FMNH 19501, 19505, 19508, 21914, 22695-96, 22698, 22700-03, 22705-07, 22711, 22713-14, 22717, 25975, 26358, 26375, 26378, 26381, 28316-18, 74614, 74633-36.1-2, 74637).

TAXONOMIC REMARKS: *Zamenis persicus* Jan, 1863 is based on two specimens diagnosed, together with *Z. rhodorachis* Jan, merely by the number of supralabials (nine) and 19 midbody scale rows. The MSNM syntype from "Schiraz" (Iran) figured in Jan & Sordelli (1867) was destroyed during World War II (Scali, 1995 and *in litt.*). Blanford (1876) stated that "the figure [...] might almost have been taken from the type of *Coluber Chesnei*" [sic] (see below and Discussion). The extant syntype (MNHN 7470) obtained in "Persia" by Pierre-Martin-Rémi Aucher was described by Duméril *et al.* (1854) as *Z. dahlui* ["Savigny"], noting differences in colour pattern ("presque [...] constituant une variété") vis-à-vis this taxon, i.e., *Platyceps najadum* (Eichwald, 1831).

Despite former statements (Günther, 1858, 1864) concerning the status of *Coluber chesneii* Martin, 1838 (allegedly identical with *C. ventromaculatus* Gray, 1834), Günther (1868) considered *Zamenis persicus* Jan likely to be a junior synonym of "*Z. chesnei*" [sic]. After examination of three racers from Shiraz, probably deposited in the 'Indian Museum', Calcutta (see Sclater, 1891) and "agreeing with *Z. persicus* in all their structural details, and only differing from Jan's figure in the absence of the black band between the eyes", Anderson (1872) erroneously concluded that "*L.* [sic]

² Eissa & El-Assy (1975) mentioned *Platyceps ventromaculatus* auct. from "below rocks in Al-Jalia", and "in old houses in Kuwait [City]"; however, the photographed specimen (Fig. 19) is a *Natrix tessellata* (Laurenti) shown upside down.

ladacensis [...] appears to be identical” with *Z. persicus*. This reference applies to *Z. ladacensis* Anderson, 1871, a taxon of the *Platyceps rhodorachis* complex. There can be no doubt that *Z. persicus* Jan actually is a junior synonym of the taxon discussed in this study, i.e., *C. chesneii* Martin or *C. ventromaculatus* Gray (see Discussion).

The monotypic genus *Acanthocalyx* Cope, 1896 (type species “*Coluber ventromaculatus* Gray”) was described on the basis of an *in situ* hemipenis showing an intensely calyculated distal portion. This feature strongly recalls the copulatory organ of the taxon dealt with in this paper (see Fig. 1 and Discussion) but the specific identity of the voucher specimen from “W. Asia” pends comparison with Near and Middle East taxa of the *Platyceps rhodorachis* complex (in prep.). Neither the individual itself nor the hemipenis are deposited in the herpetological collections of the AMNH, ANSP, or USNM (Ronald I. Crombie, Linda S. Ford, and Ned S. Gilmore *in litt.*) where most of Cope’s material is accommodated and must, therefore, be presumed lost.

MORPHOLOGY: Rostral 1.61-2.09 times broader than high. Internasals usually slightly shorter than (or nearly equal to) prefrontals; the latter coalesced in BMNH 1921.3.29.2 (Procter, 1921) and CAS 157124. Frontal 1.19-1.50 times longer than broad, 1.27-1.71 times longer than internasals and prefrontals, 0.83-1.12 times as long as parietals. Posterior border of parietals normally slightly rounded (convex) or forming an obtuse (concave) angle (straight in FMNH 35095, 74614, and 74634); with a larger detached portion along the posterior border in FMNH 19501. Head 2.06-2.33 times longer than broad.

Distance from the nostril to the eye 0.81-1.0 times the length of the internasals and prefrontals. Loreal usually longer than high (or nearly equal), situated on the posterior portion of the second and the third supralabial. Preocular single, two on right side of BMNH 1947.3.2.31, FMNH 19505, and on both sides of NHMB 15210. Normally a single anterior subocular situated, in the case of nine supralabials, on fourth (and part of fifth) supralabial and usually smaller than loreal; two suboculars in BMNH 69.8.28.130 (left), 1971.123 (detached upper part of fifth supralabial), 1971.1456-57 (*ibid.*), and FMNH 22701 (only fifth supralabial touching eye, see below). With an additional small scale between the subocular(s) and the loreal in BMNH 1947.3.2.30-31 (two on right side of 1947.3.2.30), FMNH 19505, 22701, 22717 (very small), 35079 (also with a small subloreal), MNHN 1957.59, and NHMB 15210 (very small).

Usually nine supralabials, fifth and sixth (only fifth or sixth in MNHN 1957.59 and FMNH 20939, respectively) in contact with eye (fourth and fifth or sixth and seventh in the case of eight or ten supralabials, respectively), seventh and/or eighth largest; eight supralabials in FMNH 22696, 22701, 26381, NMW 28932.2 as well as on one side in CAS 84554, 84565, FMNH 19501, 22695, 28316-17, and NMW 25452.2; a small triangular scale between the sixth and seventh or seventh and eighth supralabial in NMW 28932.2 (left) and BMNH 1947.3.2.32 (right), respectively; ten supralabials in FMNH 20939 and on one side in BMNH 1971.1457 and FMNH 22717. Two postoculars (one on right side of FMNH 74000, lower fused with sixth supralabial on left side of NMW 28932.1), upper usually larger. Posterior subocular absent except in FMNH 20939 and MNHN 1957.59. Two anterior (lower larger) and two or three posterior temporals; lower anterior temporal usually bordering seventh and eighth supralabial, divided in ZFMK 24639. CAS 84544 with an additional scale between the lower anterior temporal, the lower postocular, and the supralabials.



PLATE 1

Platyceps cf. ventromaculatus from northern Iraq (♂, MHNG 2443.17).

Normally ten sublabials (nine, rarely eleven), four in contact with first infra-maxillary, sixth (fifth, seventh) largest. Anterior and posterior pair of chin shields of nearly equal length and width or former shorter and broader; posterior chin shields separated in front by two (none or one) rows of usually small scales and four (three, sometimes two) scales behind. Gulars in three to four oblique rows between the posterior chin shields and the first ventral.

Ventrals in specimens examined 190-220 (♂♂ 190-219, ♀♀ 199-220); anal scute divided; subcaudals 80-116 (♂♂ 88-116, ♀♀ 80-110), paired except in FMNH 22701 (subcaudals 4-7 single); sum of ventrals and subcaudals 279-333 (♂♂ 280-333, ♀♀ 279-319).

Schmidt's (1939) maximum for ventrals (222) includes preventral scales (usually one or two); his minimum for males (196) may originate from a specimen not examined for the present study (see synonymy). This or a counting or printing error possibly explains the maximum (112) reported for subcaudals (probably from Iraq, see Tb. 1). Counts of 75 or less (Corkill, 1932a, 1932b; Latifi, 2000) are most probably based on specimens with incomplete tails; the maximum for Iraq (120) given by Corkill (1932a) was not confirmed later (Corkill, 1932b), and 119 subcaudals as reported by Haas (1961) for CM 33509 requires verification; it might be due to a counting or printing error.

As a rule, females have more ventrals (higher means except in group 10, see below) and fewer subcaudals than males. Baran's (1982) female (SZE 93/1977) from Ceylanpinar (36°51'N 40°03'E, Urfa Province) in southeastern Turkey, FMNH 74614

TABLE 1: Geographic variation of morphological characters including sum of ventrals and subcaudals (sum), position of first and second (19 to 15 dsr) and third (15 to 13 dsr) reduction of dorsal scale rows (dsr) in percent of the total number of ventrals (see Material and Methods), and maxillary teeth of *Platyceps* cf. *ventromaculatus*. The values give the range, mean (except maxillary teeth), and sample size (in parenthesis) and are based on the examined specimens and data from Boulenger (1893; juv., Faw Peninsula), Corkill (1932b; Tuz Khurmatu), Schmidt (1939; HUIJ 3540 [formerly FMNH 11361]), Haas (1961: CM 33508, 33541-42), Mandaville (1967: Al-Ajam), and Baran (1980: SZE 93/1977). 1) Ceylanpinar (Turkey) and Abu Kamal (Syria); 2) North Iraq (Bajji, Khanaqin, Kirkuk, Mosul, Samarra, Tuz Khurmatu); 3) Central Iraq (Al-Mansuriyah, Baghdad, Kish); 4) South Iraq (Al-Amarah, An-Nasiriyyah); 5) Al-Haditha (FMNH 159973); 6) "Iraq" (no precise locality) and "Euphrates" [BMNH 1946.1.12.95]; 7) Faw (Iraq), Kuwait and Saudi Arabia; 8) Bahrain; 9) United Arab Emirates (NIMW 32192); 10) Iran (without FMNH 109996); 11) Ar-Rutbah (Iraq); 12) Syria.

Group or specimen	ventrals		subcaudals		sum		19 to 15 dsr		15 to 13 dsr		maxillary	
	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀
1	190 (1)	199 (1)	98 (1)	80 (1)	288 (1)	279 (1)	63-64 (1)	-	86 (1)	-	14 (1)	
2	191-203 195.2 (9)	199-209 204.3 (4)	89-96 92.6 (8)	89-93 90.7 (3)	280-293 286.8 (8)	288-302 295.3 (3)	59-68 63.7 (8)	63-68 65.5 (2)	79-92 84.3 (8)	88 (1)	13-15 (11)	
3	200-219 208.7 (10)	208-220 212.7 (7)	92-107 99.6 (7)	88-99 92.9 (7)	292-325 307.6 (7)	297-315 304.3 (6)	58-66 61.4 (9)	57-67 60.4 (6)	73-85 80.3 (9)	79-90 81.8 (6)	13-16 (12)	
4	201-214 204.4 (7)	208-218 212.0 (8)	88-100 95.2 (5)	92-99 95.0 (7)	289-314 300.2 (5)	301-316 306.9 (7)	59-67 62.1 (6)	57-65 61.9 (8)	78-91 82.1 (7)	74-91 86.4 (8)	14-15 (11)	
5		211 (1)		107 (1)		318 (1)		60-61 (1)		79 (1)	15 (1)	
6	203-211 207.8 (5)	209-214 211.5 (2)	103-106 104.5 (2)	97-100 98.5 (2)	306-315 310.5 (2)	309-311 310.0 (2)	56-64 59.9 (4)	58-61 59.8 (2)	76-83 78.3 (4)	83-84 83.5 (2)	15 (4)	
7	201-206 203.4 (5)	204-212 208.3 (9)	91-102 97.3 (4)	89-104 97.7 (9)	295-304 301 (4)	299-315 306.0 (9)	58-63 61.0 (2)	57-65 61.0 (5)	74-82 78.0 (2)	79-89 82.3 (3)	14-15 (9)	
8	196-205 199.8 (5)	201-207 204.0 (2)	94-99 96.5 (4)	97 (1)	290-304 296.3 (4)	304 (1)	60 (1)	-	72 (1)	-	13-14 (3)	
9	208 (1)		99 (1)		307 (1)		57-67 (1)		75 (1)		14 (1)	
10	204-217 211.0 (6)	201-209 205.8 (4)	92-116 104.4 (5)	96-110 105.3 (3)	310-333 319.3 (4)	297-319 310.3 (3)	59-63 60.7 (5)	60-61 (1)	76-83 79.4 (5)	80 (1)	13-16 (7)	
11	201-206 203.7 (3)		88-102 96.0 (3)		294-303 299.7 (3)		61-64 62.5 (2)		82-83 82.5 (2)		14-15 (2)	
12	194-206 199.3 (7)	201-208 204.3 (3)	91-103 94.4 (7)	89-90 89.3 (3)	285-303 293.7 (7)	290-297 293.6 (3)	58-63 61.0 (4)	57-62 60.0 (2)	75-91 81.5 (4)	81-83 82.0 (2)	14-15 (11)	

(♂) from eastern Syria (Abu Kamal), and northern Iraq populations (Tb. 1: group 1-2) possess few ventrals and subcaudals (see Discussion). SZE 93/1977 has an extremely low number (80) of subcaudals and a tail/body ratio of only 0.29 (see below). Another female, CAS 159973 from Al-Hadithah (34°08'N 42°23'E), is exceptional in its high subcaudal count, i.e., 107 vs. 88-99 for Iraqi females from south of roughly 34°N latitude (Tb. 1: specimen 5 and group 3-4, respectively). Populations from Faw Peninsula, Kuwait, Saudi Arabia, and the United Arab Emirates (group 7-9) have lower means for ventrals than central and southern Iraq *Platyceps cf. ventromaculatus*.

The male sample (six specimens) from Iran (Tb. 1: group 10) is heterogeneous. NMW 25466.1 (215 ventrals) and SMF 61869-70 (214-217 ventrals, 109-116 subcaudals), all from unspecified localities ("Persien", "Iran"; see Discussion), have distinctly more ventrals and subcaudals than BMNH 69.8.28.130 from Bushehr, MHNG 1359.12 (Kermanshah Province), and MNHN 7470 (syntype of *Z. persicus*) with 204-209 and 92-103, respectively. Three probable females from southwestern Iran including FMNH 20939 (see Appendix) have 205-209 ventrals and 110 subcaudals (BMNH 79.8.15.27 [footnote 1], FMNH 20939). MNHN 1957.59 (♀) from northern Golestan has 201 ventrals and 96 subcaudals.

Dorsal scales with paired apical pits, normally in 19-19-13 rows (19-19-15 in, e.g., FMNH 74635, 19-19-14 in BMNH 79.8.15.27). FMNH 28317 with 13-15-13 dsr after ventral 176; FMNH 22707 and 22716 (13 dsr on posterior part of trunk) increase to 15 dsr in front of the vent; FMNH 22702 has 15-13-15 behind ventral 185, and BMNH 1919.7.18.14 (15 dsr on posterior part of trunk, no detailed data available) 16 dsr before the anal scute. The syntype possesses 20 dsr at the 15th ventral (reduction to 13 at ventral 20), 13 dsr on the posterior portion of the body, and 14 in front of the vent. FMNH 22711 has 21 dsr between ventrals 70 and 90 (reduction to 13 dsr at 91%ven). Guibé's (1957) anterior count (21 dsr, MNHN 1957.59) was taken in front of the 15th ventral.

In males, the first and second posterior reduction occur between ventrals 114 and 134 (56-64%ven, average of right and left side) and 122-140 (60-68%ven), respectively; the third reduction is situated from ventrals 145-179 (72-92%ven). In females, the values are 120-133 (57-67%ven), 123-136 and 144 in CAS 157121 (58-68%ven), and 161-192 (74-91%ven), respectively. In both sexes, the sequence of the first and second reduction is variable, viz., lateral (usually row 3-4, rarely involving row 2 and 5) or high (rows 7-8, sometimes vertebral row). The third (last) fusion is always high (rows 6-7, rarely 5, sometimes vertebral).

Maximum snout-vent length approximately 900 mm in FMNH 35093 (♂) and 28316 (♀). Corkill (1932b) noted a total length of 43 inches (ca. 110 cm) for a specimen from An-Nasiriyah. Tail/body ratio in males and females over 300 mm snout-vent length identical, i.e., 0.30-0.37 (0.28 or more in juveniles). According to Haas (1961) and Baran (1982) the ratio in a male from the Al-Qatif area (Al-Hasa) and the single specimen (♀) known from Turkey (SZE 93/1977, see above) is 0.39 and 0.29, respectively.

Maxillary with 13-16 teeth (Tb. 1), anterior series subisodont, diastema usually distinct (very distinct, e.g., in BMNH 1947.3.2.30-32 and FMNH 74614), posterior two teeth enlarged, last offset laterad. Palatine with 9, pterygoid and dentary 15-18 teeth.

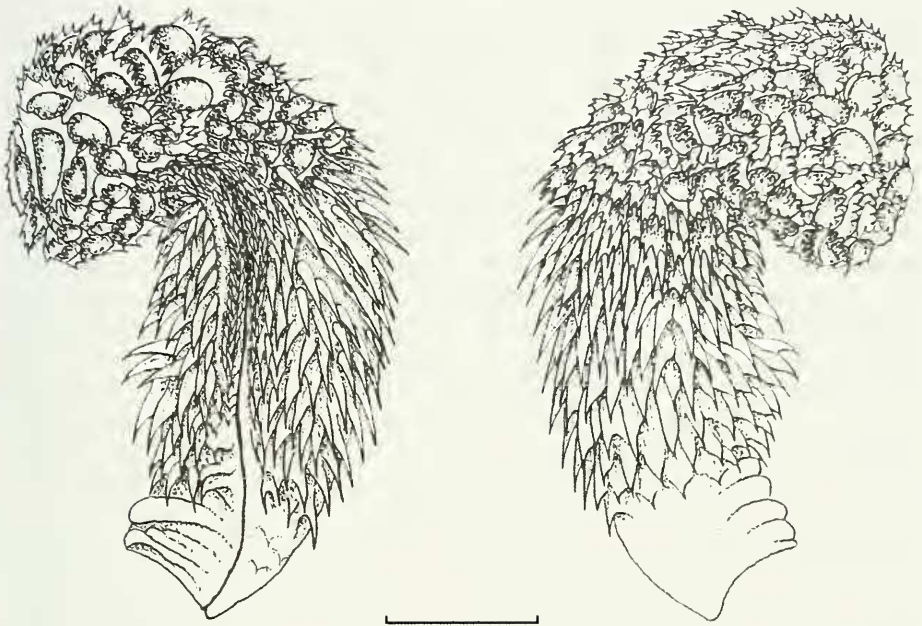


FIG. 1

Sulcate and asulcate view of everted right hemipenis of BMNH 1971.1456. Line equals 5 mm. Drawing H. Laubscher.

Hemipenis subcylindrical and spinose, *sulcus spermaticus* simple; spinose at base, with denticulate calyces distally (Fig. 1). Apex *in situ* at subcaudals 8-12 (ca. 8-12%sub); insertion of retractor muscle at subcaudals 31-39 (30-38%sub).

DISCUSSION

The systematics of the racer populations dealt with in this paper is a matter of controversy. This applies, in the first place, to Khan's (1997) concept of certain Saharo-Sindian racers (see below and Schätti, 2005: footnote 1) and the status of North African and Near East racers commonly referred to *Platyceps rogersi* auct. (e.g., Disi, 1999; Disi *et al.*, 2001).

The validity of *Zamenis rogersi* Anderson relies entirely on details of the dorsal colour pattern, i.e., transverse blotches considerably wider than the light interspaces (e.g., Schmidt, 1939; Leviton *et al.*, 1992; Disi, 1993). An analysis of 65 specimens from Libya to Syria referable to Rogers' racer on the basis of this criterion showed no difference vis-à-vis *Platyceps* cf. *ventromaculatus* (Gray, 1834) from Iraq in, for instance, the number of ventrals and subcaudals or maxillary tooth counts (Schätti, 2005). *P. rogersi* auct. includes, for instance, the Ar-Rutbah population in western Iraq or FMNH 19588 (Schmidt, 1939), NHMB 16445, MNHN 1935.370-72 (Angel, 1936), and FMNH 74614 from Abu Kamal (34°27'N 40°55'E), Syria. Further specimens from this country (e.g., FMNH 21914, NHMB 16444 and 16446, and ZISP 17017 [formerly

FMNH 19592]) including HUI 8303 from the Utaybah salt lake area (approx. 33°31'N 36°37'E) are intermediate; they have, in particular on the posterior part of the body, dorsal cross-bars narrower, or at least not wider, than the light interspaces.

NMW 28932.2, an incomplete specimen (see Appendix) from Aleppo (36°12'N 37°10'E) in northern Syria has bold transverse blotches separated by larger interspaces characteristic of most Iraqi populations. At least with regard to dorsal colour pattern, it is remarkably similar to SZE 93/1977 from Ceylanpinar (36°51'N 40°03'E) in extreme southeastern Turkey (Urfa Province) assigned to *Platyceps ventromaculatus* auct. (Baran, 1982: Fig. 1). This female with 199 ventrals is outstanding for its exceedingly low subcaudal count and tail/body ratio and shows a well-marked nuchal streak and distinct more or less oval blotches on the anterior trunk followed by transverse bars extending to the tail (see Morphology incl. Tb. 1).

Northern *P. cf. ventromaculatus* from southeastern Turkey, Aleppo and Abu Kamal (Syria), and Iraqi Kurdistan (FMNH 74633-37, NMW 25452.1-2) have 190-203 ventrals (♂♂ 190-199, ♀♀ 199-203), 80-98 subcaudals (89-98 and 80-89, respectively), and a sum of 279-289 (280-289, 279-288). These values, and in particular the sum of the ventrals and subcaudals, are lower than in specimens from Syria south of 35°N latitude except FMNH 74614 and three males from Ar-Rutbah (see Tb. 1: group 11-12). With the exception of the number of ventrals (195) of CAS 157124 (♂) from Khanaqin (34°21'N 45°24'E), *P. cf. ventromaculatus* from Iraq, adjacent provinces of Iran (Kermanshah, Khuzistan), Kuwait, and Saudi Arabia (Tb. 1: group 3-7 as well as BMNH 1919.7.18.14, MHNG 1359.12 and 2443.17, NHMB 15210, and NMW 28932.1) with 88-107 subcaudals (♂♂, ♀♀; 96 in CAS 157124) are definitely distinct from northern populations in much higher ventral and total counts, 200-220 (♂♂ 200-219, ♀♀ 206-220) and 289-325 (289-325, 296-318), respectively.

Disi (1993) reported *Platyceps ventromaculatus* auct. from various regions in Jordan ("may represent the western limit of its distribution") with 198-210 ventrals and 95-110 subcaudals, being largely intermediate between Jordan populations of Rogers' racer (Schätti, 2005: Tb. 1) and Iraqi *P. cf. ventromaculatus* from south of roughly 34°N latitude (Tb. 1: group 3-5).

Except for the minimum values (%ven) of the third dsr reduction in specimens from Egypt (♀♀) and the Negev (69% in ♂♂, 68% in ♀♀, Schätti, 2005: Tb. 1) as well as the relatively frequent occurrence of coalesced prefrontals in populations so far assigned to Rogers' racer, this taxon perfectly conforms with Gray's racer from the area under consideration in scale characters, dentition, and hemipenis features (length of organ, ornamentation, and insertion of retractor muscle). Therefore, *Zamenis rogersi* Anderson, 1893 is considered to be conspecific with *Platyceps cf. ventromaculatus* (Gray, 1834) as understood in this paper.

Platyceps cf. ventromaculatus is distributed from the Cirenaica (Libya) to the United Arab Emirates and Iran. There, this racer is recorded, for instance, from Kermanshah (Khosrovi), Khuzistan (Bandar-e-Shahpur, Susangerd), Bushehr, and Fars Province ("Shiraz", Yezd-i-Khast) as well as the Kopet Dag area as exemplified by the examined material and literature records (e.g., Jan, 1863; Anderson, 1872; Blanford, 1881; Boulenger, 1893; Schmidt, 1939; Raï, 1965 [see synonymy]). Most probably, it also occurs in Kurdistan Province.

Latifi (2000) quoted *Platyceps ventromaculatus* auct. from the eastern Zagros escarpment (Esfahan, Markazi), Qom and Teheran Province as well as Golestan and Semnan in northern central Iran (see below). *P. cf. ventromaculatus* is recorded from Dashli Borun, Golestan, on the basis of MNHN 1957.59. Guibé (1957) reported this subadult female from the Atrek River, i.e., the border with Turkmenistan, as Karelin's racer, noting differences in dorsal colour pattern vis-à-vis typical *P. karelini* ("48 taches transversales d'un noir intense sur le dos, alternant avec des taches plus petites sur les flancs. Une bande noire, à contours irréguliers est étendue de la préfrontale à la première tache dorsale"). Based on this specimen, there can be no doubt that *P. cf. ventromaculatus* inhabits comparatively mesic regions of northern Iran.

FMNH 109996 from Quchan (37°06'N 58°31'E) in northern Khorasan most probably belongs to the taxon discussed in this paper. This large male (approx. 110 cm total length) has 216 ventrals, 114 subcaudals, 14+2 maxillary teeth separated by a very distinct diastema, and a dorsal colour pattern that strongly recalls *Platyceps cf. ventromaculatus*. Its ventral and subcaudal count are very similar to three males (NMW 25466.1, SMF 61869-70) from unspecified localities in "Iran" (see Morphology).

Boulenger (1889, 1893) reported the occurrence of "*Zamenis ventrimaculatus*" at Bezd (35°12'N 60°26'E) in eastern Khorasan, Iran ("Afghanistan") on the basis of a mutilated racer (BMNH 86.9.21.100) with "116" (115) subcaudals. This incomplete individual belongs to *Platyceps rhodorachis* auct. (in prep.).

The first specimens of *Platyceps cf. ventromaculatus* were recorded by the Euphrates and Tigris expedition under Commander (then Lieutenant-Colonel) Francis Rawdon Chesney and described as a new species, *Coluber chesneii* Martin, 1838. The type series from the "Euphrates", presented to the Geological Society of London (Chesney, 1850), was made up of several individuals with incomplete tails. Only a single adult female (BMNH 1946.1.12.95) is deposited in The Natural History Museum of London (Günther, 1858; Boulenger, 1893).

With the publication of Günther's (1858) 'Catalogue', *Coluber chesneii* Martin has been subsumed by *Platyceps ventromaculatus* (Gray). Günther (1864) noted that *C. chesneii* "agrees completely with the types" of Gray's racer described on the basis of a specimen from Major-General Hardwicke's collection of Indian reptiles. This opinion, i.e., conspecificity of eastern (India, Pakistan) and western populations (in particular specimens from Iraq and the Arabian Peninsula), was unanimously shared by later herpetologists who considered *P. ventromaculatus* to be a Sindo-Arabian species. However, Khan (1997: 56, 58) regards "all reports of this snake from Iran and Iraq as pertaining to local races of *C.[oluber] rhodorachis* [Jan, 1863] with low ventral and subcaudal counts" and is "inclined to believe that all *C. ventromaculatus* reported from west of the Indus [...] are actually color morphs of *C. rhodorachis*" (see also Khan & Khan, 2000 and Khan, 2002).

The idea that western populations of *Platyceps ventromaculatus* auct. (i.e., *P. cf. ventromaculatus*) belonged to the *P. rhodorachis* species group is completely unsupported by facts and not further discussed here. Moreover, *P. ventromaculatus (sensu stricto)* crosses the Indus and is found, e.g., at Hab Chawki (25°01'N 66°53'E, Las Bela District) in extreme southeastern Baluchistan (Minton, 1966: AMNH 85864) and at least as far west as Gwadar (25°07'N 62°19'E) on the western Makran coast (Boulenger, 1893: BMNH 80.11.10.201).

Apparently, *Platyceps ventromaculatus* (s. s.) is absent from inland regions of southwestern Pakistan as well as from Afghanistan and southeastern Iran. Latifi's (2000) reports of *P. ventromaculatus* auct. from, for instance, unspecified places in Sistan-va-Baluchistan Province are considered unreliable because they are probably based on mis-identified literature records (e.g., Blanford, 1876). On the whole, the distribution of Gray's racer in eastern Iran is far from clear and requires, in the first place, more field work.

TABLE 2: Ventrals, subcaudals, sum thereof, position of anterior and last dorsal reductions (in %ven), maxillary teeth (see Table 1 for explanations), and hemipenis features (position of apex, length of retractor muscle in %sub) of *Platyceps* cf. *ventromaculatus* ("West", including data from Schätti, 2005) and *P. ventromaculatus* (*sensu stricto*) from India and Pakistan ("East").

Region	sex	ventrals	subcaudals	sum	19-15	15-13	maxill. t.	hemipenis
West	♂♂	184-219	88-117	280-333	56-69	69-92	13-16	7-13/28-38
	♀♀	190-220	80-111	279-319	55-68	68-91		
East	♂♂	194-207	106-124	305-328	58-67	74-86	14-16	6-10/23-25
	♀♀	199-214	97-114	297-327	56-66	75-87		

The taxon discussed in this paper and *P. ventromaculatus* (s. s.) from India and Pakistan overlap with regard to several external morphological features. However, *P. cf. ventromaculatus* exhibits greater variability in body scale counts and certain hemipenis features (Tb. 2). These racers also show differences in details of dorsal colour pattern (e.g., Leviton *et al.*, 1992: Pl. 15F vs. 15H) and hemipenis ornamentation, i.e., the size of basal spines and distribution of apical calyces (in prep.). Moreover, they may be geographically separated as noted above, and preliminary mtDNA data (Schätti *et al.*, 2005: Fig. 8) suggest specific status for *P. cf. ventromaculatus* as understood in this paper. By all means, the potential validity of *Coluber chesneii* Martin and the systematic concept of Gray's racer require a more detailed investigation of eastern populations, i.e., *P. ventromaculatus* (s. s.). For the time being, racer populations dealt with in this paper are referred to as *P. cf. ventromaculatus* and systematic conclusions will be presented in a forthcoming paper (submitted).

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Appendix. *Platyceps* cf. *ventromaculatus* examined for the purpose of this study; specimens marked with an asterisk were used for the calculation of cephalic indices; a † denotes juveniles without morphological data and NMW 28932.2 (head and part of trunk); not including FMNH 109996 (see Discussion). – BAHRAIN: BMNH 1936.6.4.11 (“Bahrain”, juv. ♂), †1970.2485 (Hamalah, 26°09′N 50°28′E), †1970.2486 (Az-Zallaq [Zallaqah], 26°03′N 50°29′E), 1971.120 (juv.) and †1971.121 (Hamalah, 1971.122-23 (Hamalah, ♀ ♂), †1971.124-25 (Hamalah), 1971.1456 (Budaiya, 26°13′N 50°27′E, ♂), 1971.1457 (Al-Awali, 26°05′N 50°33′E, ♂), 1971.1458 (Al-Jasrah, 26°10′N 50°27′E, ♀); ZFMK *24639 (“Bahrain”, ♂). – IRAN: BMNH 69.8.28.130 and 79.8.15.27 (Bushehr, 28°58′N 50°50′E, ♂ ♀, see Morphology); FMNH 20939 (Yezd-i-Khast [Izad Khvast], 31°31′N 52°07′E, subad. [probably ♀]); MHNG *1359.12 (east of Khosrovi, approx. 34°23′N 45°29′E, ♂); MNHN 7470 (“en Perse”, ♂ syntype of *Zamenis persicus* Jan, leg. “Aucher-Eloy”), *1957.59 (Dashli Borun, 37°38′N 54°49′E); NHMB *15210 (“Susangard am Karkkeh” [Susangerd], 31°34′N 48°11′E, ♀); NMW *25466.1 (“Persien”, ♂, see Morphology and Discussion), 28932.1 (Ash Sharqat [Kalat Shergat], 35°28′N 43°15′E, ♂); SMF 61869-70 (“Iran”, ♂ ♂, see Morphology and Discussion); ZFMK 31602 (“Umgebung von Shiras” [file entry, see WERNER 1917], juv.). – IRAQ: BMNH †92.9.1.5-7 (Faw Peninsula, approx. 29°58′N 48°28′E), 1919.7.18.14 (Samarra, 34°12′N 43°53′E, ♀), 1921.3.29.2 (Al-Amarah, 31°51′N 47°11′E, ♀), *1946.1.12.95 [formerly 50.10.21.19] (“Euphrates”, ♀ syntype of *Coluber chesneii* Martin); CAS 157121 (Al-Mansuriyah [Jabal Hamrin], 34°05′N 44°53′E, ♀); 157124 (Khanaqin, 34°21′N 45°24′E, juv. ♂), 159973 (Al-Hadithah, 34°08′N 42°23′E, ♀); FMNH 11064-65 (Kish, 32°32′N 44°42′E, juv. and unsexed ad. [damaged head and forebody only]), 19501 (Baghdad, 33°20′N 44°24′E, ♂), 19505-06 (Baghdad, ♂, skull), *19508 (Ar-Rutbah, 33°02′N 40°17′E, subad. ♂), †19660 (“Iraq”, juv.), *21914 (Ar-Rutbah, ♂), *22695 (Baghdad, subad. ♀), *22696 (An-Nasiriyah, 31°03′N 46°16′E, ♀), *22698 (An-Nasiriyah, ♀), *22700-03 (An-Nasiriyah, ♀, ♂ ♂), †22704 (An-Nasiriyah, juv.), 22705 and *22706-07 (An-Nasiriyah, juv. ♂, ♀ ♀), †22708-10 (An-Nasiriyah, juveniles), *22711 (An-Nasiriyah, ♀), †22712 (An-Nasiriyah, juv.), 22713-14 (An-Nasiriyah, ♂ ♂ [subad., juv.]), †22715 (An-Nasiriyah, juv.), 22716-*17 (An-Nasiriyah, juv., ♀), *25975 (Baghdad, ♂), 26357-*58 (Baghdad, unsexed, ♂), *26375 (Baghdad, ♂), *26378 (Baghdad, ♀), *26381 (Baghdad, ♀), *28316 (Baghdad, ♀), *28317-18 (Baghdad, ♂ ♀), 35089 (“Iraq”, subad. ♀), *35091-93 (“Iraq”, ♂ ♂), *35095 (“Iraq”, ♂), †68806 (Baghdad, juv.), *74633-35 (“Chem Chemal Valley”, ca. 35°32′N 44°50′E, ♂ ♂, ♀), *74636[2]-37 (“Chem Chemal Valley” [“Mound of Jarmo”], ♂ ♂); MCZ *45620-21 (Baghdad, ♂ ♂), †58868 (Kish area), 123181 (“probably Kish area”, juv. ♂); MHNG 2443.17 (Baiji [34°56′N 43°29′E] – Al-Haditha, ♂); NMW *25452.1-2 (Mosul, 36°20′N 43°07′E, ♀ ♂); ZMZ 121023 (Baghdad, unsexed). – KUWAIT: BMNH 1947.3.2.30-32

("Kuwait", ♂, juv. ♀, ♀). – SAUDI ARABIA: BMNH 1979.711 (Al-Hufuf [Hofuf], 25°23'N 49°35'E, ♀); CAS 84544 (Dhahran, 26°18'N 50°08'E, ♂), 84554 (Dhahran, ♀), 84565 (Dhahran, unsexed), 135528 (Dhahran, juv. ♀), 140370 (Tarut Island, 26°34'N 50°04'E, subad. ♀); FMNH *35079 (Al-Jubayl, 25°24'N 49°39'E, ♀), *74000 (Dhahran, ♀). – SYRIA (see Discussion): FMNH 19588 ("between Homs and Palmyra", approx. 34°38'N 37°30'E, ♂), FMNH 74614 (Abu Kamal, 34°27'N 40°55'E, ♂); HJ 8303 ("Salzsee" [Buhayrat Al-Utaybah (Ataïbé)], approx. 33°31'N 36°37'E, ♀); MNHN 1935.370-72 ("Palmyre" [Tudmur], 34°33'N 38°17'E, ♂♂, ♀), 1986.538 ("Palmyre", ♂); NHMB 16444-46 ("Tibni" [Tibnah], 32°59'N 36°13'E, ♂♂, ♀); †NMW 28932.2 (Aleppo, 36°12'N 37°10'E); ZISP 17017 [formerly FMNH 19592] ("between Homs and Palmyra", hgr. ♂). – UNITED ARAB EMIRATES: NMW *32192 (Sir Bani Yas [Island], 24°19'N 52°37'E, ♂).